

FIG.1

- 10 CDMA TRANSMISSION APPARATUS
- 11 SPREADING CODE GENERATION
- 12 MAPPING
- 5 TRANSMISSION DATA
- 14 SYMBOL COPY
- 15 MULTIPLICATION
- 16 FILTER
- 17 QUADRATURE MODULATION

10

FIG.2

- 20 CDMA RECEPTION APPARATUS
- 21 SPREADING CODE GENERATION
- 23 QUADRATURE DEMODULATION
- 15 24 FILTER
- 26 MULTIPLICATION
- 27 INTER-SYMBOL ADDITION
- 28 DEMAPPING
- RECEPTION DATA

20

FIG.3

- 100 SPREADING CODE GENERATING APPARATUS
- 101 CALCULATION
- 102 $e^{j(2\pi n/N)}$ CODE LENGTH SETTING
- 25 103 CODE NUMBER SETTING
- 104 CHIP NUMBER SETTING
- 105 $n=a \times b$ CALCULATION

FIG. 4

ST0 START
 ST1 SET CODE LENGTH N (ARBITRARY NATURAL NUMBER)
 ST2 CODE NUMBER
 5 ST3 CHIP NUMBER
 ST5 CALCULATE $C(a, b) = e^{j(2\pi n/N)}$
 ST6 OUTPUT $C(a, b)$
 END

10 FIG. 5

200 CDMA TRANSMISSION APPARATUS
 201 SPREADING CODE GENERATION
 202 MAPPING
 TRANSMISSION DATA
 15 204 SYMBOL COPY
 205 MULTIPLICATION
 206 FILTER
 207 QUADRATURE MODULATION

20 FIG. 6

300 CDMA RECEPTION APPARATUS
 301 SPREADING CODE GENERATION
 303 QUADRATURE DEMODULATION
 304 FILTER
 25 306 MULTIPLICATION
 307 INTER-SYMBOL ADDITION
 308 DEMAPPING

RECEPTION DATA

FIG.7A~FIG.7C

SPREADING CODE

5

FIG.9

400 SPREADING CODE GENERATING APPARATUS

401 $e^{j(2f(n)\pi/N)}$ CALCULATION

102 CODE LENGTH SETTING

10 103 CODE NUMBER SETTING

104 CHIP NUMBER SETTING

105 $n=a \times b$ CALCULATION

FIG.10

15 500 CDMA TRANSMISSION APPARATUS

501 SPREADING CODE GENERATION

202 MAPPING

TRANSMISSION DATA

204 SYMBOL COPY

20 205 MULTIPLICATION

206 FILTER

207 QUADRATURE MODULATION

FIG.11

25 600 CDMA RECEPTION APPARATUS

601 SPREADING CODE GENERATION

303 QUADRATURE DEMODULATION

- 304 FILTER
- 306 MULTIPLICATION
- 307 INTER-SYMBOL ADDITION
- 308 DEMAPPING
- 5 RECEPTION DATA

FIG.12

- 700 CDMA TRANSMISSION APPARATUS
- 701 SCRAMBLING CODE GENERATION
- 10 702 MULTIPLICATION
- 501 SPREADING CODE GENERATION
- 202 MAPPING
- TRANSMISSION DATA
- 204 SYMBOL COPY
- 15 205 MULTIPLICATION
- 206 FILTER
- 207 QUADRATURE MODULATION

FIG.13

- 20 800 CDMA RECEPTION APPARATUS
- 801 SCRAMBLING CODE GENERATION
- 802 MULTIPLICATION
- 601 SPREADING CODE GENERATION
- 303 QUADRATURE DEMODULATION
- 25 304 FILTER
- 306 MULTIPLICATION
- 307 INTER-SYMBOL ADDITION

308 DEMAPPING
RECEPTION DATA

FIG.14

- 5 3-factor SPREADING
- 6-factor SPREADING
- 9-factor SPREADING
- 12-factor SPREADING
- 15-factor SPREADING
- 10 18-factor SPREADING

FIG.15

- 900 CDMA TRANSMISSION APPARATUS
- TRANSMISSION DATA #1
- 15 202A MAPPING #1
- 206 FILTER
- 207 QUADRATURE MODULATION

FIG.16

- 20 1000 CDMA RECEPTION APPARATUS
- 303 QUADRATURE DEMODULATION
- 304 FILTER
- 308a DEMAPPING #1
- RECEPTION DATA #1

25

FIG.17

1100 CDMA RECEPTION APPARATUS

15-factor SPREADING

9-factor SPREADING

3-factor SPREADING

TRANSMISSION DATA #1

5 202 MAPPING #1

1101 FIVE-POINT IDFT

1102 1103 THREE-POINT IDFT

206 FILTER

207 QUADRATURE MODULATION

10

FIG.18

1200 CDMA RECEPTION APPARATUS

1201 1203 THREE-POINT DFT

1202 FIVE-POINT DFT

15 303 QUADRATURE DEMODULATION

304 FILTER

308 DEMAPPING #1

RECEPTION DATA #1

15-factor SPREADING

20 9-factor SPREADING

3-factor SPREADING

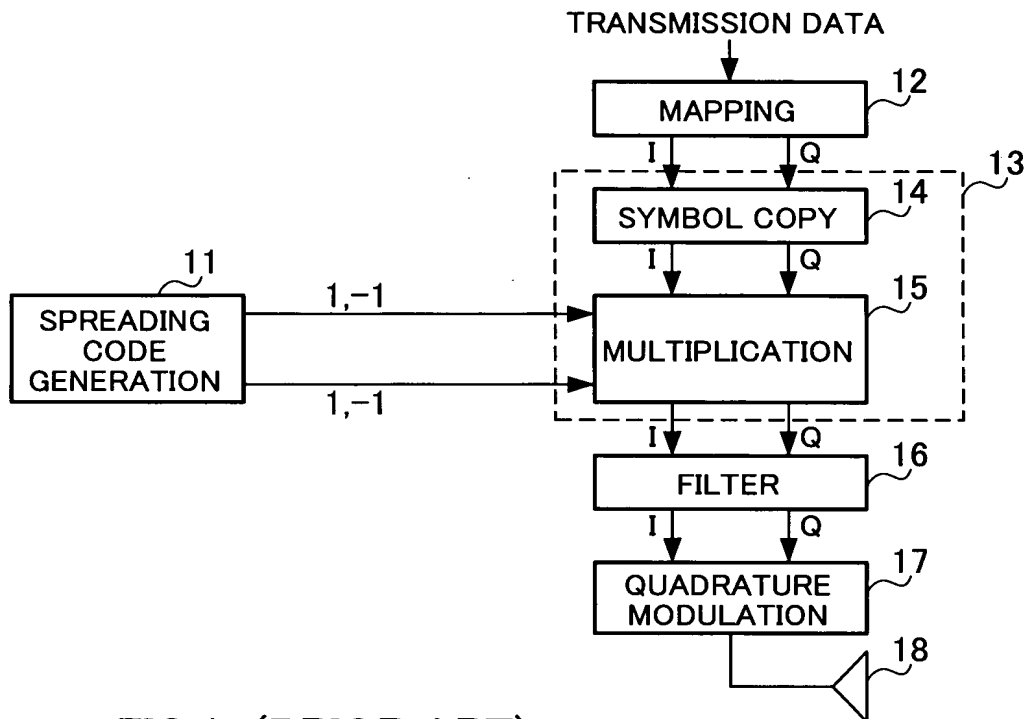
10 CDMA TRANSMISSION APPARATUS

FIG.1 (PRIOR ART)

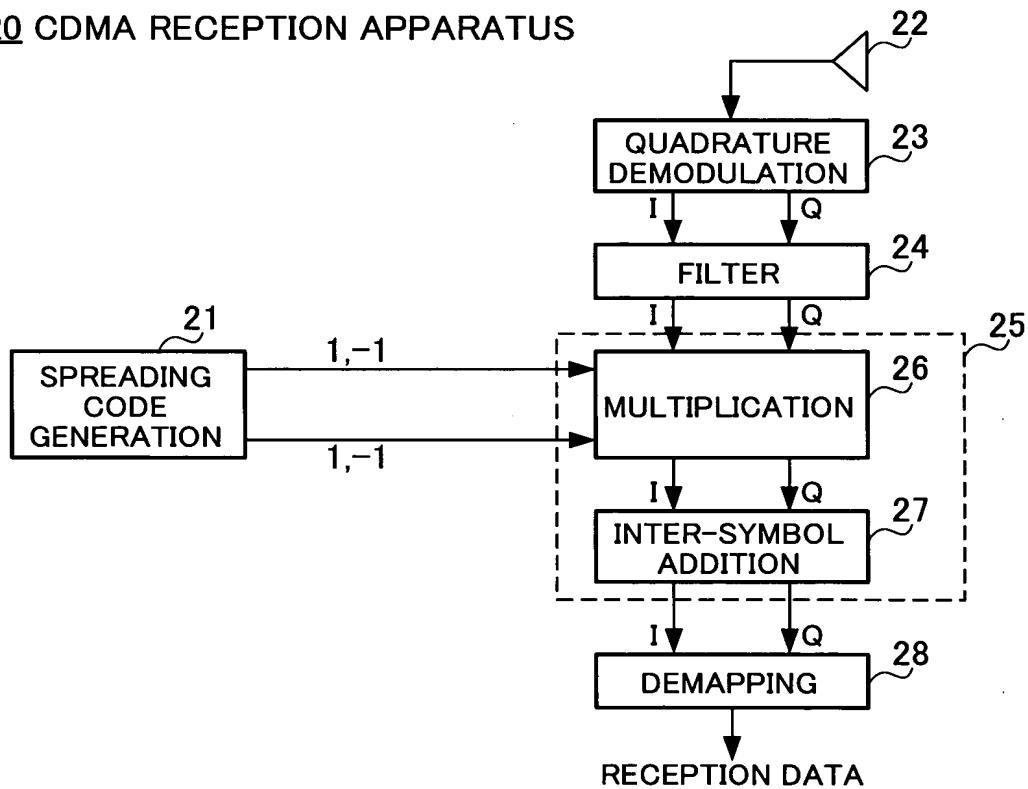
20 CDMA RECEPTION APPARATUS

FIG.2 (PRIOR ART)

100 SPREADING CODE GENERATING APPARATUS

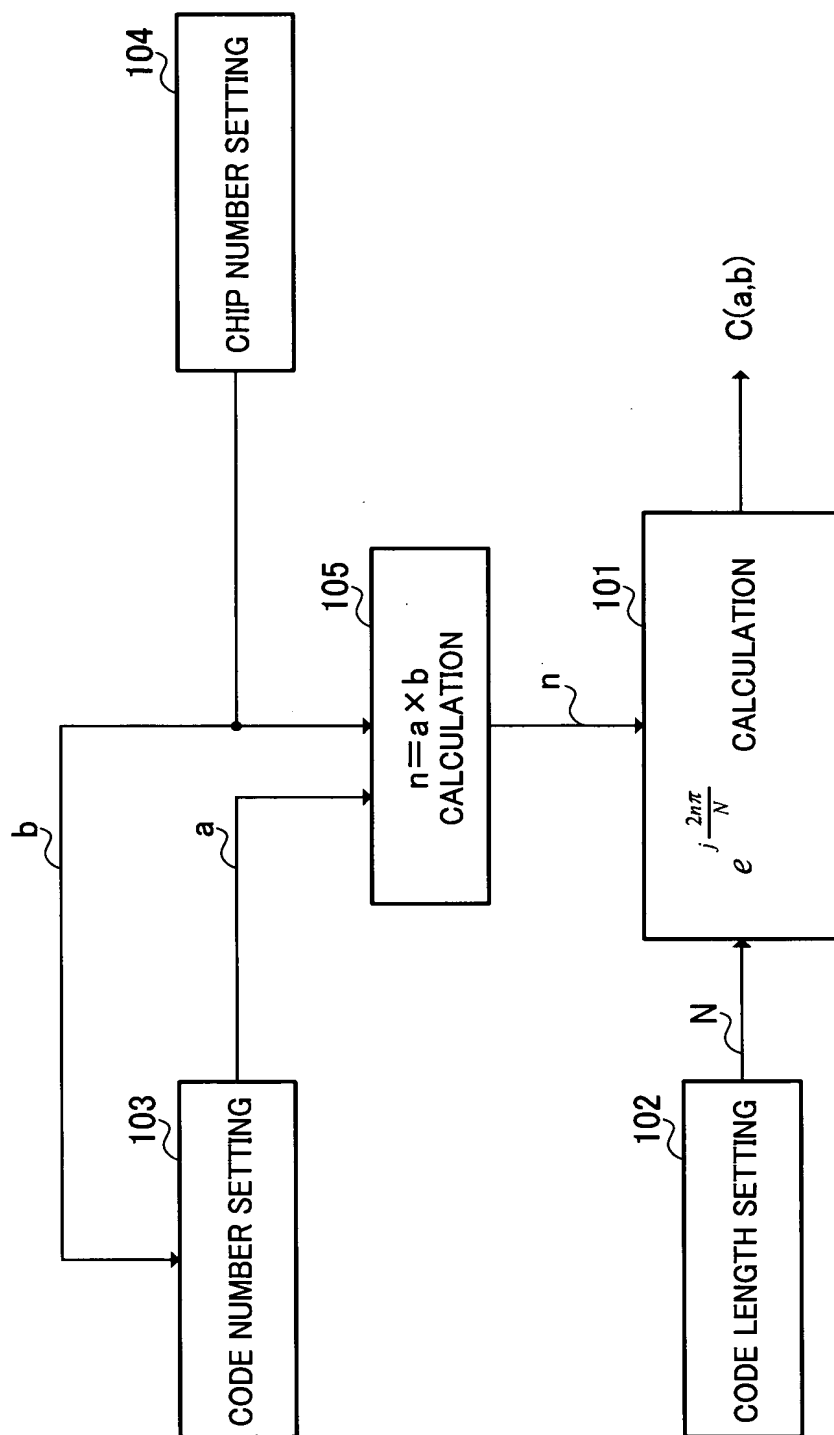


FIG.3

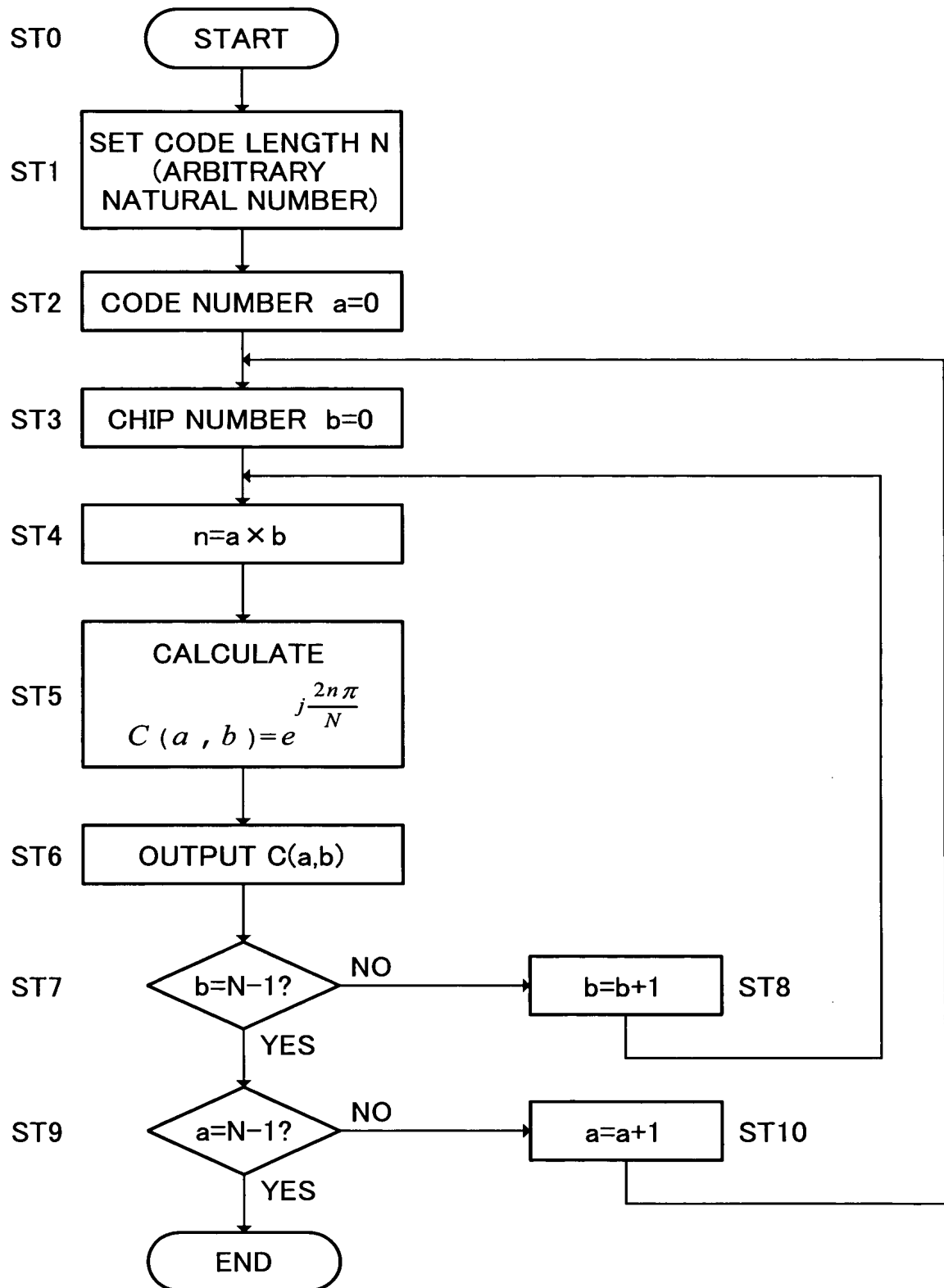


FIG.4

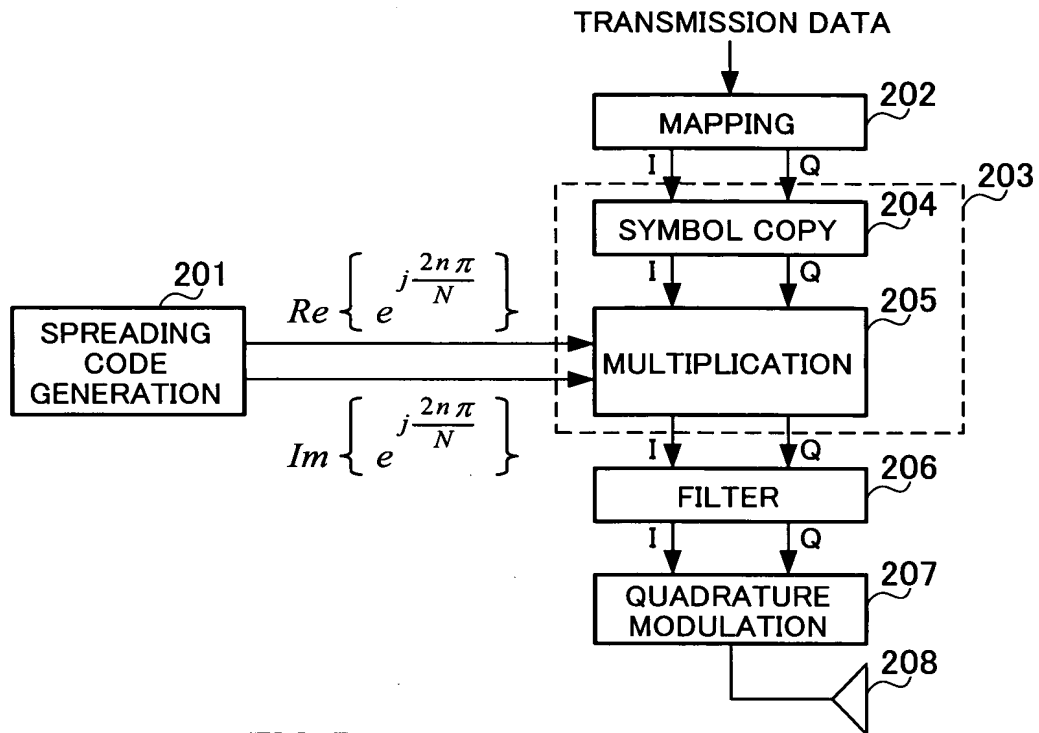
200 CDMA TRANSMISSION APPARATUS

FIG.5

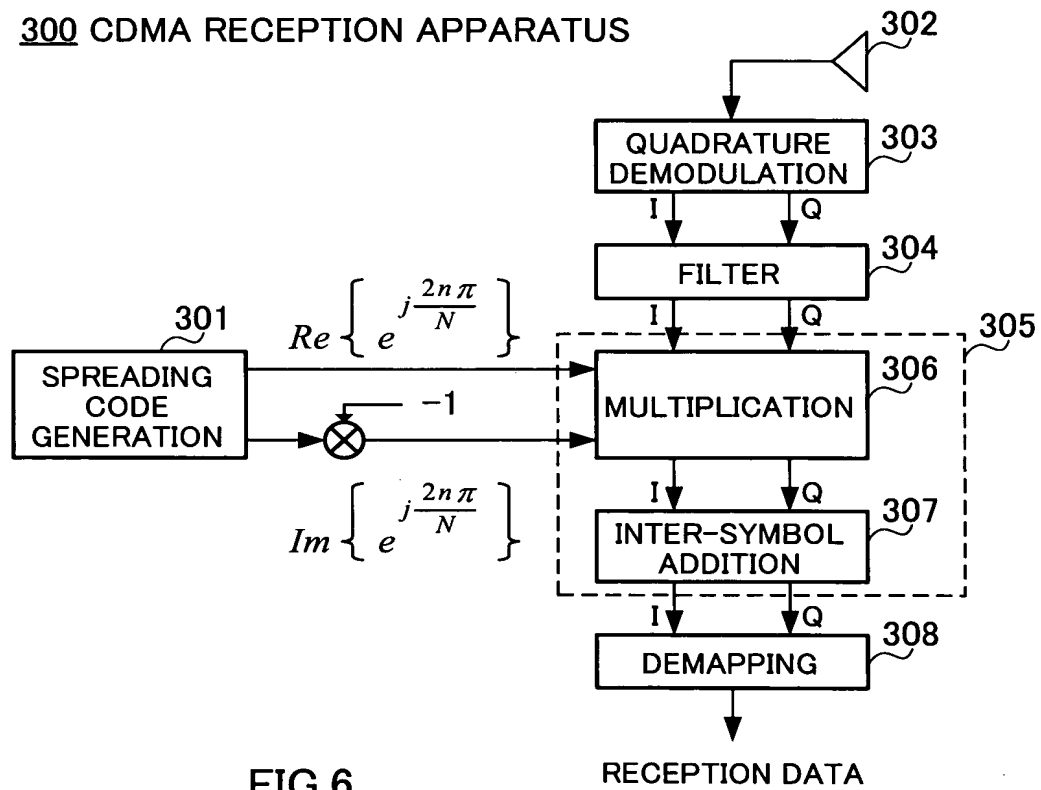
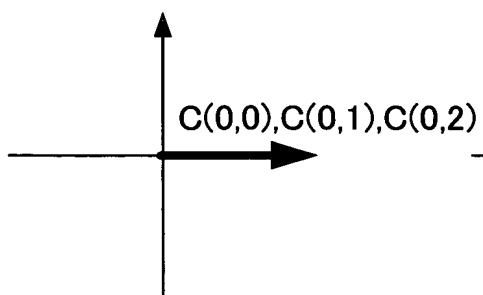
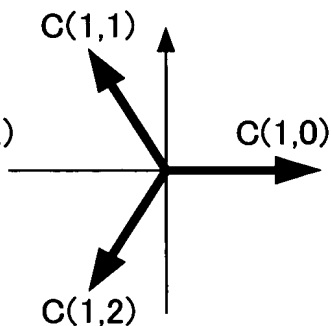
300 CDMA RECEPTION APPARATUS

FIG.6



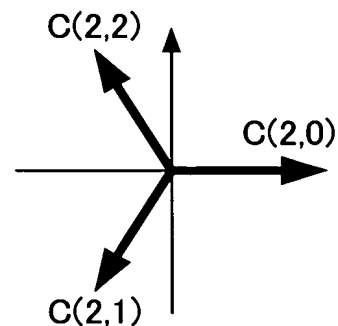
SPREADING
CODE 0
($a=0$)

FIG. 7A



SPREADING
CODE 1
($a=1$)

FIG. 7B



SPREADING
CODE 2
($a=2$)

FIG. 7C

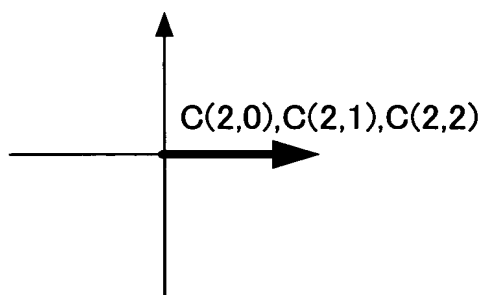


FIG. 8A

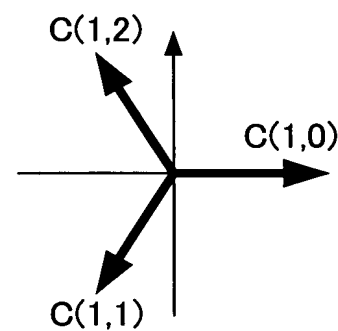


FIG. 8B

400 SPREADING CODE GENERATING APPARATUS

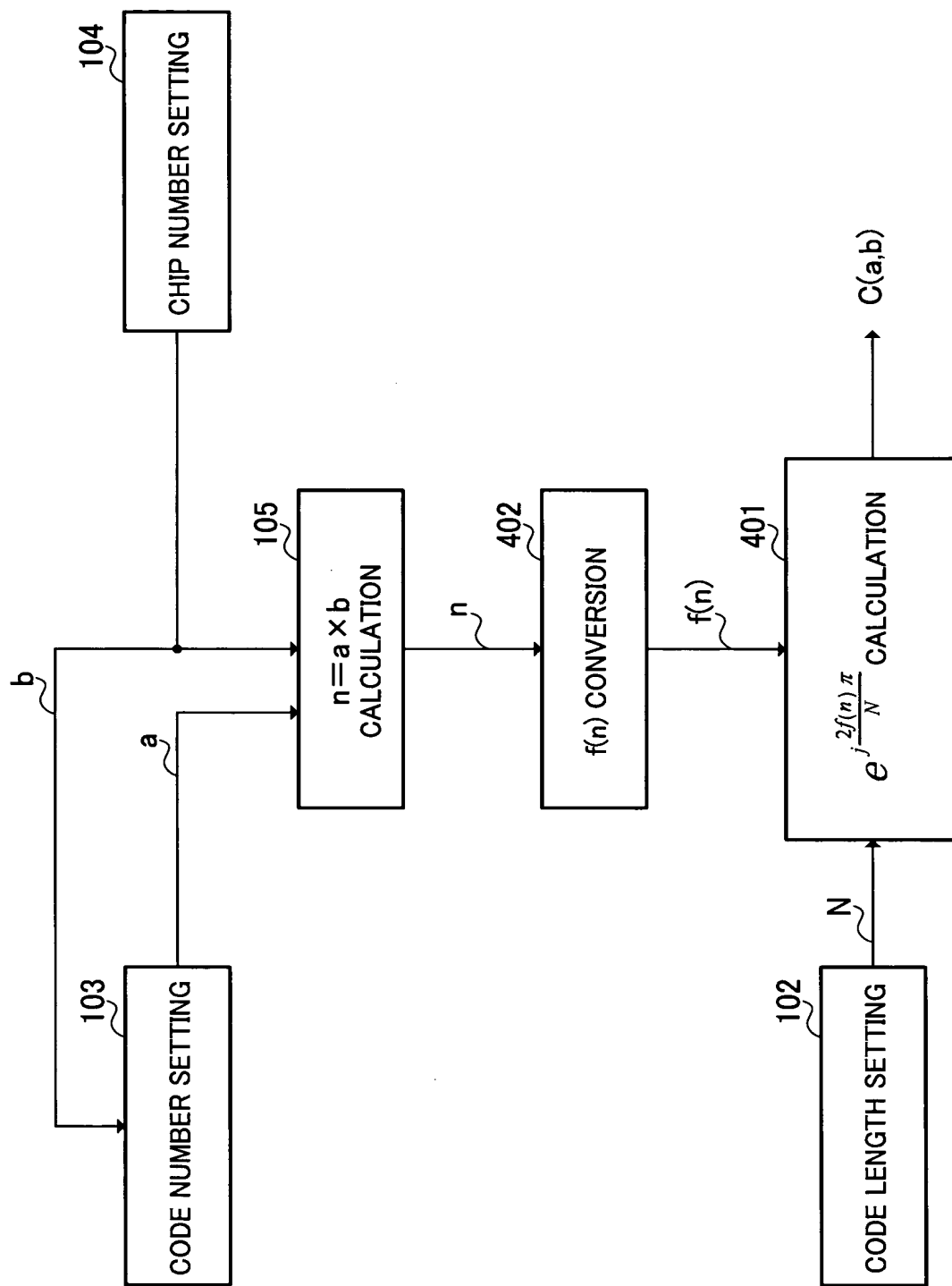


FIG.9

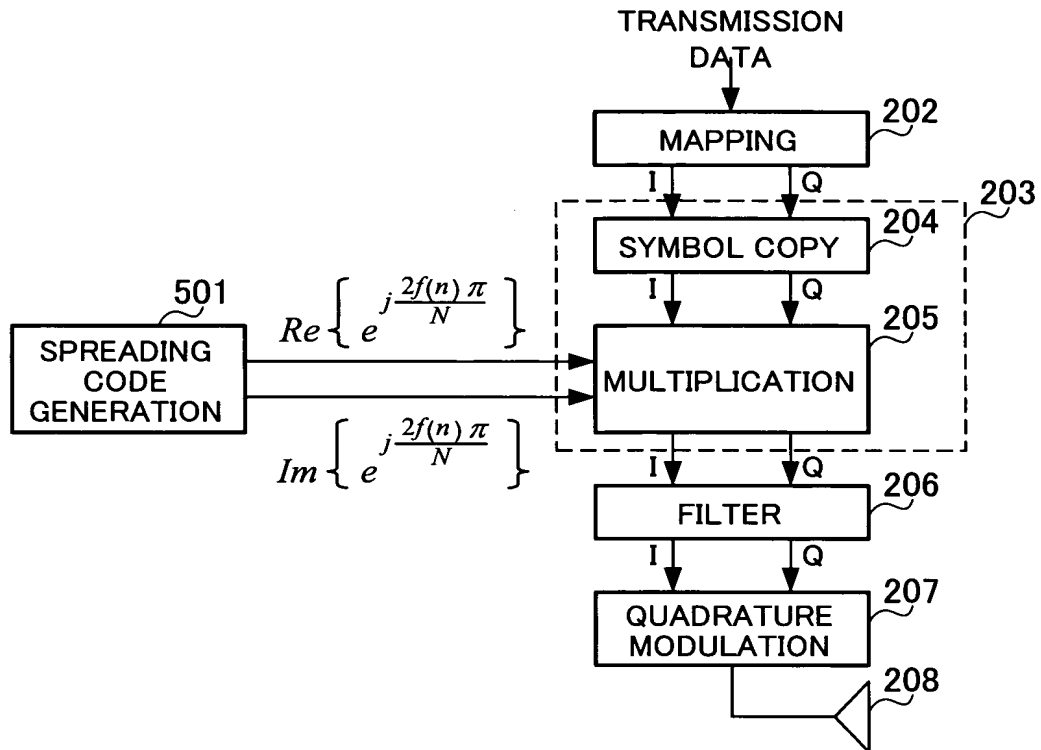
500 CDMA TRANSMISSION APPARATUS

FIG.10

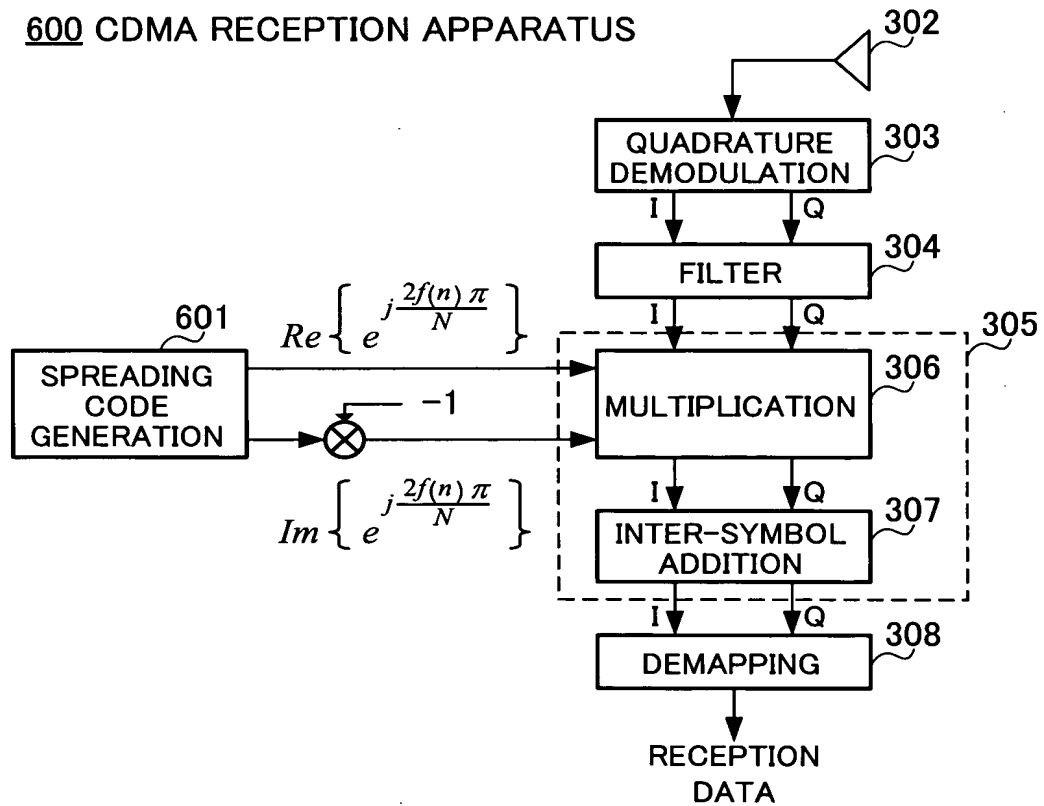
600 CDMA RECEPTION APPARATUS

FIG.11

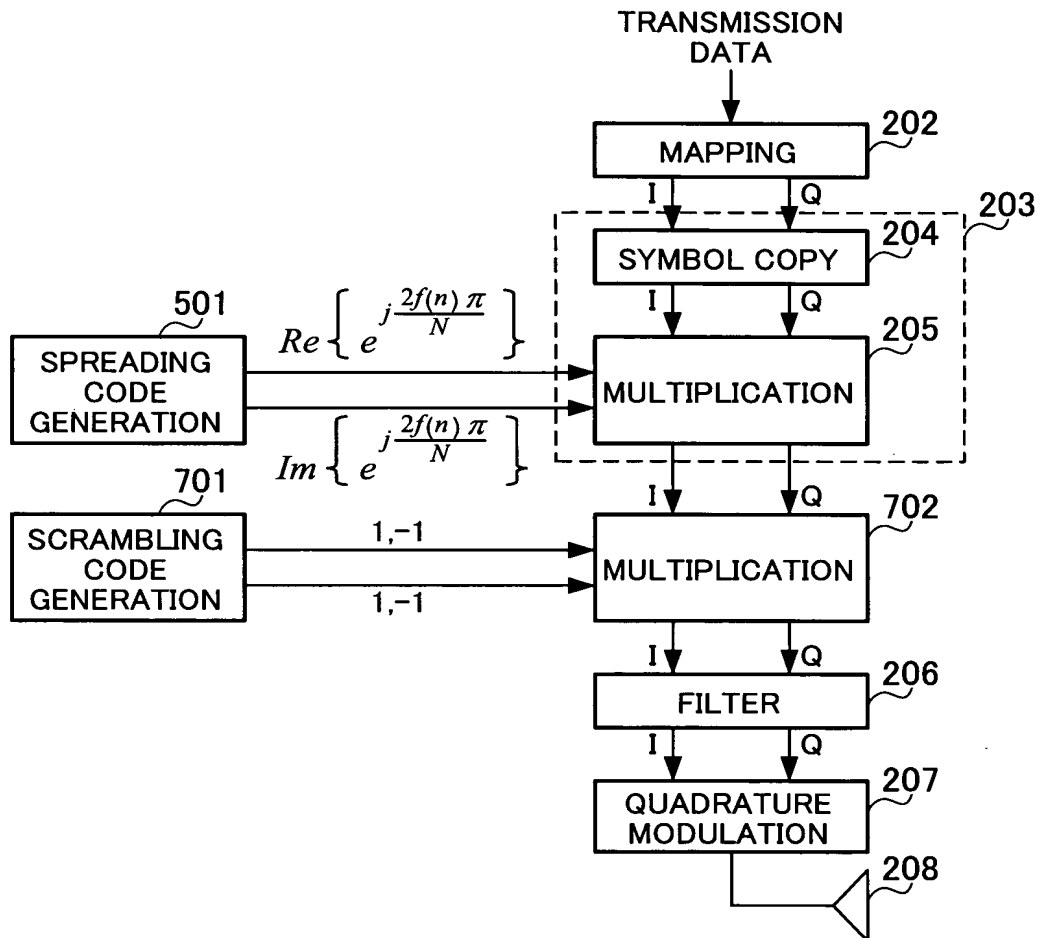
700 CDMA TRANSMISSION APPARATUS

FIG.12

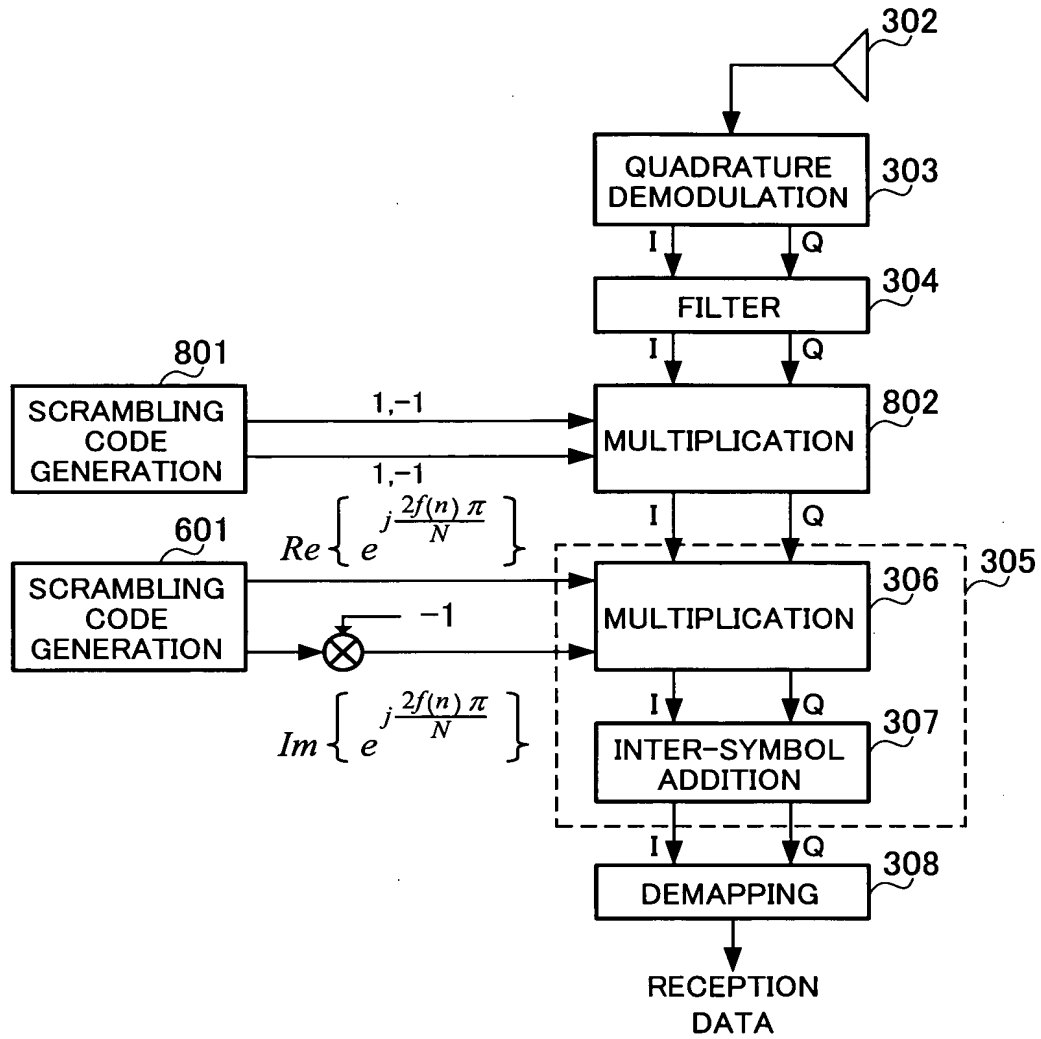
800 CDMA RECEPTION APPARATUS

FIG.13

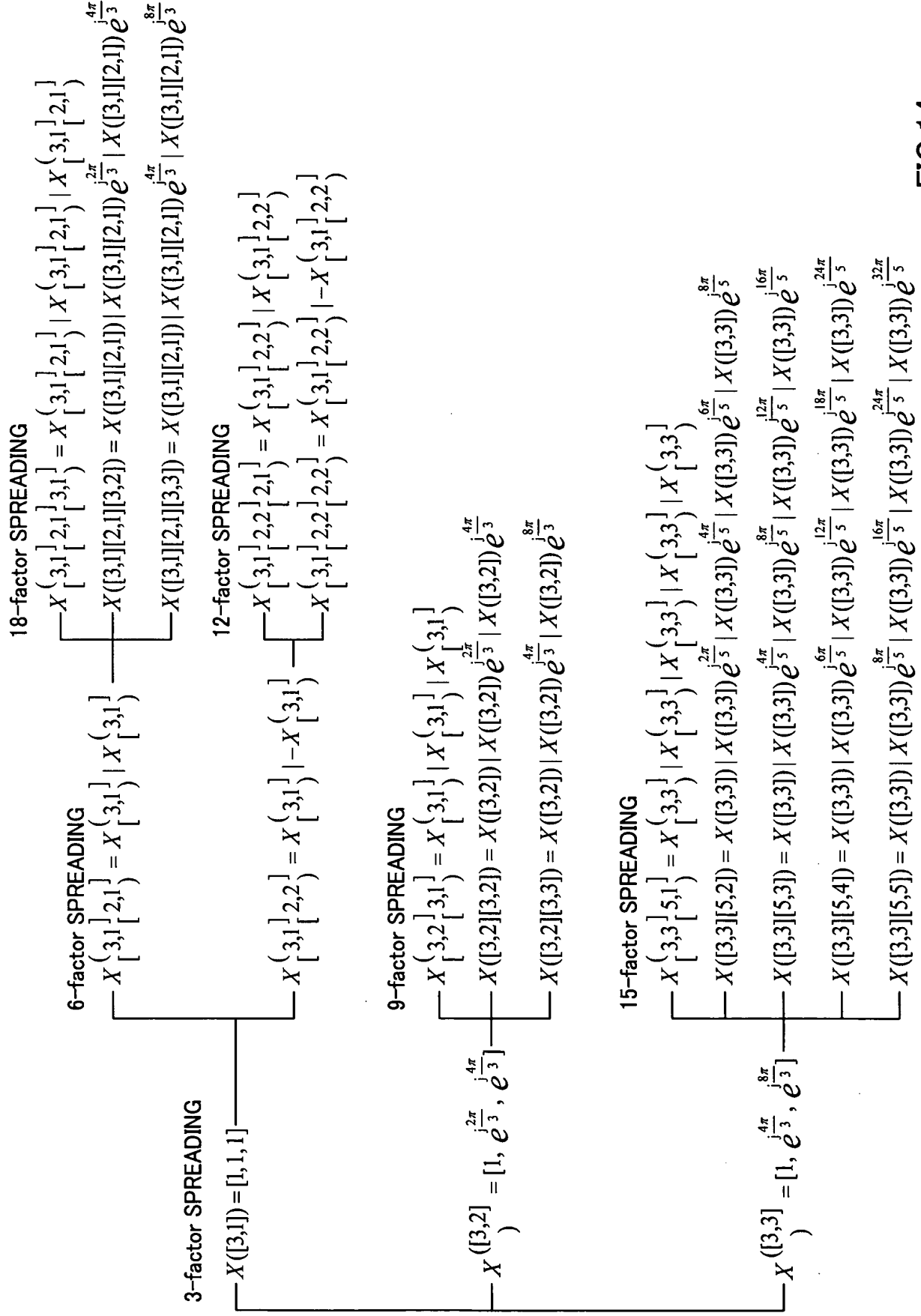


FIG.14

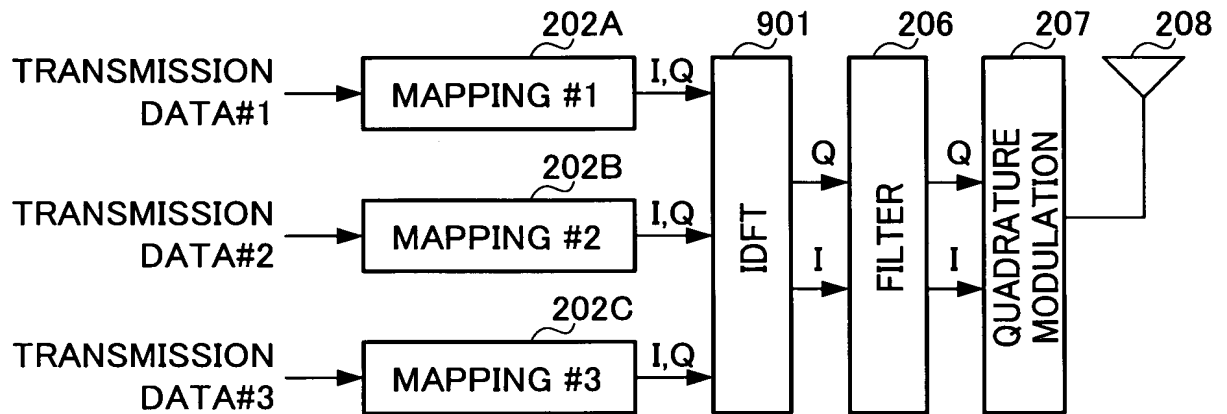
900 CDMA TRANSMISSION APPARATUS

FIG.15

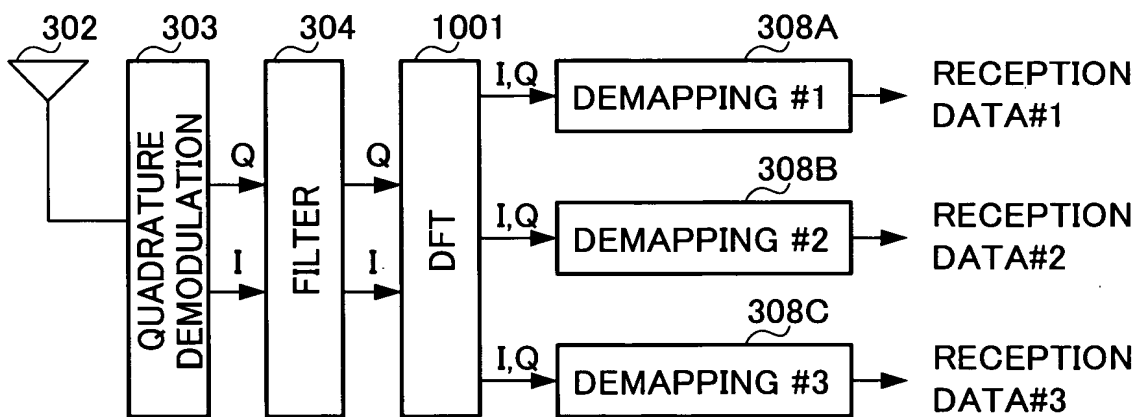
1000 CDMA RECEPTION APPARATUS

FIG.16

1100 CDMA TRANSMISSION APPARATUS

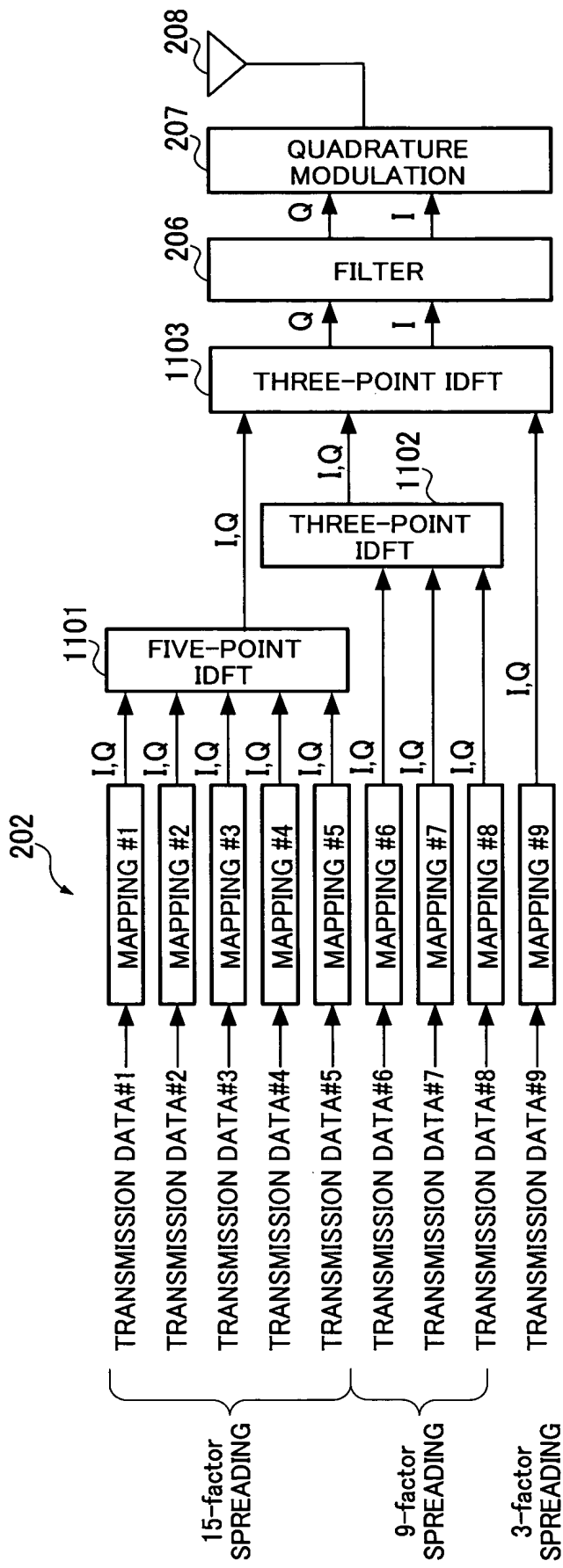


FIG.17

1200 CDMA RECEPTION APPARATUS

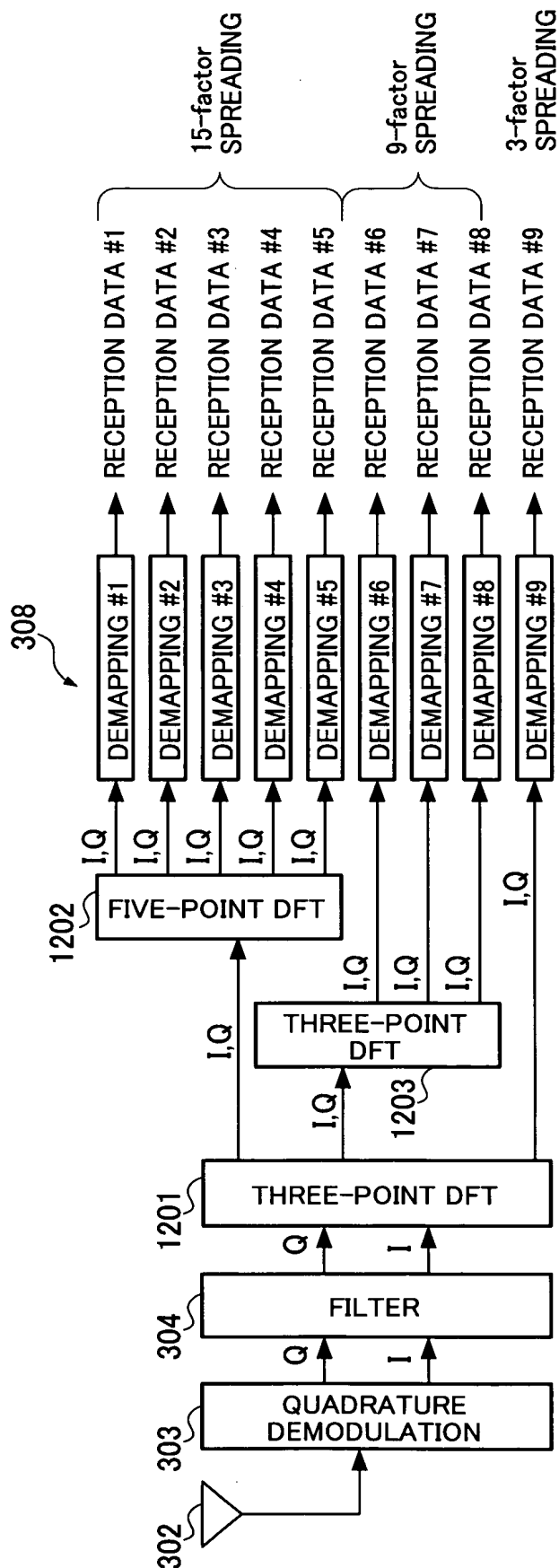


FIG.18